

(d:) REMARKS

The foregoing amendment was made in response to an Office Action mailed 9 March 2005. By the Action Claims 1-36 were examined. Claims 1-8, 11-17 and 20-36 were rejected. Claims 9, 10, 18 and 19 were objected to but indicated as directed to allowable subject matter. Excluding an antecedent basis issue raised with respect to claim 33, all of the claims rejections were under 35 USC 103 for obviousness. Various combinations involving two to four out of four references were relied on in making the rejections. The references were Bernazzani et al. (EP 1,077,441), Kirkley et al. (US 4,451,871), Molinaroli (US 6,265,984) and von Bauer (US 5,428,388). Common to all of the rejections was the combination of Bernazzani et al. in view of Kirkley et al. This was the precise combination applied to the three independent claims, 1, 27 and 33. Bernazzani was discussed at length in the last response. Kirkley was newly cited. For purposes of this response it was found necessary only to discuss Kirkley.

Claim 33 has been amended to overcome the antecedent basis issue. Otherwise the claims are presented as they stood after the last response. Claims 1-36 remain active.

As stated in the first sentence of the Summary of the Invention in the pending application, "The invention provides a marker luminaire combining a super bright LED and a low energy drive circuit to promote long battery life". The three independent claims all include language directed to developing this aspect of the invention. Claim 1 provides:

a low current level energization circuit operably connected to the light emitting diode for supplying current to the light emitting diode to cause the light emitting diode to illuminate the visible surface of the light transmitting element at an intensity level below a useful threshold of human photopic vision and above a threshold of scotopic vision.

Thus “low current is defined in terms of the response produced in the LED light source.

Claim 27 provides:

diode drive circuitry connected to the battery to draw power therefrom and further connected to the light emitting diode to deliver drive currents to the light emitting diode sufficient to illuminate the light scattering element above the threshold of darkness adapted human vision but below the threshold of useful photopic vision

Here the word “low” is not used at all. The circuit is defined as one which, in effect, leaks current to the LED light source to produce a defined light intensity level. Claim 33 provides:

an electrical energization circuit supplying the threshold current to the light emitting element of the light scattering illumination source

The term “threshold current” is defined in the claim as one at which an LED light source emits light visible to a human eye adapted for vision at less than photopic levels.

In considering these claim limitations it is important to keep in mind that it must be possible to intentionally drive the LED sources at substantially below their rated maximum current levels. This is explicitly taught in the application, at page 5, lines 13-15 where it states: “. . . super bright LEDs may be operated at a current which is [a] small fraction of their rated current for the diode . . . and still provide a level of illumination useful as a marker for darkness adjusted vision.” Again on page 5, at lines 23-26, the application states: “. . . super bright, white LEDs rated at 15 to 20 milliamps can be operated in ranges extending from just below 5 milliamps to a few microamps and produce perceptible light. Extraordinarily long battery life . . . can be achieved at these current levels.”

It is the Examiner’s contention that the Kirkley patent for a “**Safety Light or the Like with *High Current Drive***” (See Title of Kirkley patent, emphasis supplied) teaches meeting the present claim limitations relating to a circuit supplying a very low current to

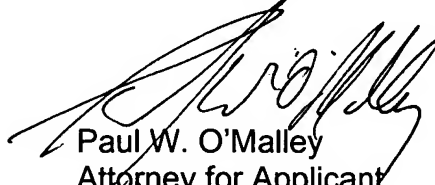
a Light Source such as an LED. The Action states “Kirkley teaches a circuit having a resistor (26) may [sic] provide a very low current for lighting a light source as light emitting diode (30) via a battery device (24). . . Therefore . . . Kirkley in the system of Bernazzani [provides for using] minimum current to the lighting device.” Consideration of the Kirkley reference however shows that Kirkley teaches neither providing a very low current for lighting source nor providing a “minimum” current to the device. In fact, Kirkley teaches overdriving the devices.

Kirkley achieves what he terms “long battery life” (which he doesn’t define) by making light emission from the LED light source used in his device intermittent. This intermittent nature is achieved by using a motion (or movement) sensitive switch (28). Use of such a switch in either the present invention or the Bernazzani device would render the devices useless since they are intended to be stationary markers. Further, Kirkley does not use the term “low” to refer to a level of current relative to the rating of the LED. Instead he refers to “a very low current light emitting diode” (col. 3, line 40) which is apparently intended to suggest that the device itself has a low current rating. These LEDs are not to be driven at a current which is low compared to their current rating. Quite to the contrary, the “light emitting diode 30 is operated by applying current from battery means 24 *which greatly exceeds the current rating of the light emitting diode 30.*” Kirkley, col. 3, lines 47-50. Kirkley goes on to suggest that LEDs can be safely driven at current levels up to five times their maximum ratings. This is done to generate “intermittent bursts of light which are highly visible”. See Kirkley, col. 1, lines 55 to 57. Kirkley, in essence, dumps as much current into an LED as he can without destroying the LED to produce intermittent bursts of bright light. The present application teaches that useful steady light can be generated from LEDs at high efficiency when the device is operated at a fraction of its rated current level or to produce light visible during darkness to a darkness adapted eye. Kirkley teaches away from the present invention.

Modification of Bernazzani by Kirkley does not produce the invention as claimed because neither reference teaches providing LED drive circuitry which operates at low current levels relative to the rated capacity of the LED, or drive circuitry used to deliver current to the LED so that it emits light at less than photopic vision levels. The references are not properly combined since the Kirkley circuit, which includes upon an intermittently closed switch to save power would not function in the Bernazzani device and thus defeats the purpose of the Bernazzani device. Kirkley was relied on for all of the substantive rejections and since Kirkley was misapplied, all of the rejections are misplaced.

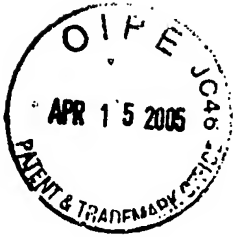
The remaining dependent claims add still further limitations further distinguishing the preset invention over the cited reference. Applicant believes the Claims as resubmitted or amended are in condition for allowance and respectfully requests favorable action by the Examiner.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that I caused this Amendment to be mailed to the Commissioner for Patents on or before 13 April 2005.

Date: 13 April 2005



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